



UNITED STATES PATENT AND TRADEMARK OFFICE

cln
UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/753,507	01/08/2004	D. Amnon Silverstein	200309636-1	9854

22879 7590 03/28/2007
HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER

PETERSON, CHRISTOPHER K

ART UNIT	PAPER NUMBER
----------	--------------

2609

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	.03/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/753,507

Applicant(s)

SILVERSTEIN ET AL.

Examiner

Christopher K. Peterson

Art Unit

2609

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-6, 10-15, 17-19, 23, and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Roddy (US Patent Pub. # 20034/0160881).

As to claim 1, Roddy (Fig. 9 and 6) discloses an image sensing device comprising:

- a plurality of photosensors (60) arranged in at least one array, such that each of the photosensors (60) converts incident light into an output signal, the photosensors (60) and their respective output signals being divided into a plurality of color channels (Para 49);
- a filter associated with each of the photosensors (60), the filters selecting light within predetermined spectral bands for conversion by the photosensors (60) into the output signals, one color channel comprising at least two color sub-channels and the filters associated with the photosensors (60) of at least two of the color sub-channels having overlapping spectral bands wherein one of

the overlapping spectral bands is narrower in bandwidth than another of the overlapping spectral bands (Para 43).

As to claim 12, this claim differs from claim 1 only in that the claim 1 is an apparatus claim whereas claim 12 is a method. Thus method claim 12 is analyzed as previously discussed with respect to claim 1 above.

As to claim 2, Roddy teaches the image sensing device of claim 1 wherein the photosensors (60) are arranged in a single array and the filters associated with each photosensor (60) are arranged in a mosaic of filters located over the photosensor array (Para 43).

As to claim 3, Roddy teaches the image sensing device of claim 2 wherein the mosaic of filters is arranged in a Bayer pattern (Para 06).

As to claim 4, Roddy (Fig. 4) teaches the image-sensing device of claim 1 wherein a beam splitter (36 and dichroic mirror 32 and 34) is provided which splits incident light into a plurality of paths and a separate filter/photosensor array combination is located in each path (30R, 30B, 30BG, 30G), there being a separate path and respective filter/photosensor array combination provided for each color channel or sub-channel (Para 41).

As to claim 5, Roddy teaches the image-sensing device of claim 1 wherein a beam splitter (36, 32, and 34) is provided which splits incident light into a plurality of paths and a separate filter/photosensor array combination is located in each path, there being a separate path and respective filter / photosensor array combination provided for each color channel, and whereby the at least one of the color channels that is further

Art Unit: 2609

divided into a plurality of sub-channels (30BG, 30G) is represented by a single filter/photosensor array combination wherein a filter associated with each photosensor of the plurality of sub-channels is arranged in a mosaic of filters located over the photosensor array (Para 41).

As to claim 6, Roddy teaches the image sensing device of claim 1 wherein the color channels comprise red (30R), green (30G) and blue (30B) color channels and the green color channel (30G) is divided into a plurality of sub-channels, a first one of which uses a first green filter type (30G) and a second of which uses a second green filter type (30BG) having a spectral band which is narrower in bandwidth than and overlapping with the spectral band of first green filter type (Para 41 and 43).

As to claim 10, Roddy teaches the image sensing device of claim 6 wherein the blue channel is divided into a plurality of sub-channels, a first one of which uses a first blue filter type (30B) and a second of which uses a second blue filter type (30BG) having a spectral band which is narrower in bandwidth than and overlapping with the spectral band of the first blue filter type (Para 41 and 43).

As to claim 11, Roddy teaches the image sensing device of claim 1 wherein the color channels comprise cyan, yellow, magenta and green color channels and the green channel is divided into a plurality of sub-channels, a first one of which uses a first green filter type and a second of which uses a second green filter type having a spectral band which is narrower in bandwidth than and overlapping with the spectral band of first green filter type (Para 49 and 50). The first green channel is made up of cyan and

Art Unit: 2609

yellow and the second one is made from cyan. Roddy also states the array can be configured in different ways.

As to claim 13, this claim differs from claim 2 only in that the claim 2 is an apparatus claim whereas claim 13 is a method. Thus method claim 13 is analyzed as previously discussed with respect to claim 2 above.

As to claim 14, this claim differs from claim 3 only in that the claim 3 is an apparatus claim whereas claim 14 is a method. Thus method claim 14 is analyzed as previously discussed with respect to claim 3 above.

As to claim 15, Roddy teaches the method of claim 14 wherein the mosaic of filter elements comprises red (30R), green (30G) and blue (30B) elements associated with red green and blue color channels and the green color channel comprises two green sub-channels (30G and 30BG)(Para 43).

As to claim 17, this claim differs from claim 4 only in that the claim 4 is an apparatus claim whereas claim 17 is a method. Thus method claim 17 is analyzed as previously discussed with respect to claim 4 above.

As to claim 18, this claim differs from claim 5 only in that the claim 5 is an apparatus claim whereas claim 18 is a method. Thus method claim 18 is analyzed as previously discussed with respect to claim 5 above.

As to claim 19, this claim differs from claim 6 only in that the claim 6 is an apparatus claim whereas claim 19 is a method. Thus method claim 19 is analyzed as previously discussed with respect to claim 6 above.

Art Unit: 2609

As to claim 23, this claim differs from claim 10 only in that the claim 10 is an apparatus claim whereas claim 23 is a method. Thus method claim 23 is analyzed as previously discussed with respect to claim 10 above.

As to claim 24, this claim differs from claim 11 only in that the claim 11 is an apparatus claim whereas claim 24 is a method. Thus method claim 24 is analyzed as previously discussed with respect to claim 11 above.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roddy in view of Yang (US Patent # 5923380).

As to claim 7, Roddy teaches the limitation "first green sub-channel", Roddy does not teach the use of a Kodak.TM. Wratten.TM. #58 (green tricolor) filter. Yang teaches the image sensing device of claim 6 wherein the first green sub-channel uses a Kodak.TM. Wratten.TM. #58 (green tricolor) filter (Col. 7, line 23- 38). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a Kodak.TM. Wratten.TM. #58 (green tricolor) filter as taught by Yang to the "first green sub-channel" of Roddy, because the use of a known filter color, such as

Art Unit: 2609

a Kodak Wratten color filter, the spectral sensitivity of the CCD will be known (Col. 3, line 61 – Col. 4, line 10).

As to claim 20, this claim differs from claim 7 only in that the claim 7 is an apparatus claim whereas claim 20 is a method. Thus method claim 20 is analyzed as previously discussed with respect to claim 7 above.

5. Claims 8 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roddy in view of Yang as applied to claims 7 and 20 above, and further in view of Kaplan (US Patent #6219140).

As to claim 8, Roddy in view of Yang teaches the limitation "second green sub-channel", Roddy in view of Yang does not teach the use of a Kodak.TM. Wratten.TM. #99 (green) filter. Kaplan teaches the image sensing device of claim 6, wherein the first green sub-channel uses a Kodak. TM. Wratten.TM. #99 (green) filter (Col. 4, line 42 – Col. 5, line 12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a Kodak.TM. Wratten.TM. #99 (green) filter as taught by Kaplan to the "second green sub-channel" of Roddy in view of Yang, because the use of a known filter color, such as a Kodak Wratten color filter, the apparatus will be able to compensate for spectral fluctuations (Col. 2, line 44 – 48).

As to claim 21, this claim differs from claim 8 only in that the claim 8 is an apparatus claim whereas claim 21 is a method. Thus method claim 21 is analyzed as previously discussed with respect to claim 8 above.

Art Unit: 2609

6. Claims 9 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roddy in view of Gann (US Patent #7154545).

As to claim 9, note the discussion of Roddy above, Roddy does not teach wherein the red channel is divided into a plurality of sub-channels. Gann (Fig. 2) teaches the image sensing device of claim 6 wherein the red channel (100 and 102) is divided into a plurality of sub-channels, a first one of which uses a first red filter type and a second of which uses a second red filter type having a spectral band which is narrower in bandwidth than and overlapping with the spectral band of the first red filter type (Col. 5, line 63 – Col. 6, line 3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided wherein the red channel is divided into a plurality of sub-channels, a first one of which uses a first red filter type and a second of which uses a second red filter type having a spectral band which is narrower in bandwidth than and overlapping with the spectral band of the first red filter type as taught by Gann to the apparatus of Roddy, because the additional spectral responses improve the spectral measurement accuracy, and increase the bit-depth, with little or no incremental cost, and with little or no negative impact on native input sampling rate or signal-to-noise (Col. 3, line 36 – 43).

As to claim 22, this claim differs from claim 9 only in that the claim 9 is an apparatus claim whereas claim 22 is a method. Thus method claim 22 is analyzed as previously discussed with respect to claim 9 above.

Art Unit: 2609

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roddy in view of Shizukuishi (US Patent Pub. #2004/0100570).

As to claim 16, note the discussion of Roddy above, Roddy does not teach wherein the Bayer pattern comprises alternating rows of filters a first of which includes red filters and green filters of the first green sub-channel and the second of which includes blue filters and green filters of the second green sub-channel. Shizukuishi (Fig. 2) teaches the method of claim 15 wherein the Bayer pattern comprises alternating rows of filters a first of which includes red filters (R) and green filters (G2) of the first green sub-channel and the second of which includes blue filters (B) and green filters (G1) of the second green sub-channel (Para 152 - 153).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided wherein the Bayer pattern comprises alternating rows of filters a first of which includes red filters and green filters of the first green sub-channel and the second of which includes blue filters and green filters of the second green sub-channel as taught by Shizukuishi to the apparatus of Roddy, because the color solid-state image pickup device is inexpensive to manufacture and suppresses the occurrence of a false signal, a false color, and enables high-sensitivity, high-resolution, and faithful color reproduction. (Para 29).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2609

Hattori (US Patent # 5995136) is cited to teach a frame sequential type imaging apparatus for obtaining high resolution object image by irradiating frame sequential light on the object, photoelectrically converting the object image and processing signals by a solid state imaging device.

Eastman Kodak Pub. # B-3AKIC is cited to teach the different color codes for the Wratten filter series.

Inquiries

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher K. Peterson whose telephone number is 571-270-1704. The examiner can normally be reached on Monday - Friday 7:30 - 5:00 EST.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh D. Nguyen can be reached on 571-272-7772. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2609

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CKP

7 March 200739


CHANH D. NGUYEN
SUPERVISORY PATENT EXAMINER